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# **FIRST REPORT OF JTC 1 SC 37 BIOMETRICS**

Submitted by: Fernando L. Podio, JTC 1 SC 37 Acting Chairman

As a way of introduction to the JTC 1 community, a brief summary of related experience for the Acting Chair of JTC 1 SC 37 – Biometrics is included in this report.

## **1. MANAGEMENT SUMMARY**

### **1.1 JTC 1 SC 37 STATEMENT OF SCOPE**

The goal of this new JTC 1 SC is ensuring a high priority, focused, and comprehensive approach worldwide for the rapid development and approval of formal generic biometric standards. It intends to support the accelerated deployment of significantly better, open systems standard-based security solutions for purposes such as homeland defense and the prevention of ID theft. In order to achieve its goals the SC needs to develop the necessary standards to enable interoperability and data interchange between applications and systems.

This newly established SC is intended to satisfy the need for a formal international standards development forum able to coalesce a wide range of interests among IT organizations, the biometric industry and end-users of biometric-based solutions for multiple Identification and Verification applications. It must also meet the need for international biometric data interchange and interoperability standards for use in multiple applications such as homeland security, healthcare, financial, and employee IDs independently of how the biometric data structures are transmitted and stored. By establishing this SC, the JTC 1 community is perceived as having recognized the need for this formal international standards forum where biometric standards can be developed for multiple applications in the most efficient and cost-effective way, providing the most efficient approach for the utilization of biometric experts' time and avoiding conflicting approaches and time-consuming duplication of efforts.

The initial JTC 1 SC 37 scope is: “Standardization of generic biometric technologies to support interoperability and data interchange between applications and systems. Generic biometric standards include: common file formats; application programming interfaces; biometric templates; template protection techniques; and related application/implementation profiles, as well as methodologies for conformity assessment.”

### **1.2 MARKET REQUIREMENTS OF THE SC WORK.**

According to the Biometric Consortium [1], “*Biometrics*” are automated methods of recognizing an individual through a physiological or behavioral characteristic. Biometric technologies are becoming the foundation of an extensive array of highly secure identification and personal verification solutions. The need for these technologies is apparent. In addition to supporting homeland security and preventing ID fraud, biometric-based solutions are able to provide for confidential financial transactions and personal data privacy. Enterprise-wide network security infrastructures, the protection of buildings from unauthorized individuals, employee IDs, secure electronic banking, investing and other

financial transactions, retail sales, law enforcement, and health and social services are already benefiting from these technologies. A range of new applications can be found in such diverse environments as amusement parks, banks, mobile devices, passport programs and driver licenses, colleges, and school lunch programs.

According to authoritative market forecasts of the biometric industry, before September 11, 2001, the worldwide sales were projected to be well over \$1 billion and perhaps as much as \$2.5 billion by 2010 [2]. Also, according to these reports, the industry was on track of meeting these forecasts at the end of 2001. Biometric technologies for personal identification and verification systems have received prominent attention worldwide in the aftermath of the events of September 11, 2001. Recent forecasts from the same sources and other market experts [3] indicate now that worldwide biometric sales may reach over \$1 billion by 2004 and \$2 billion by 2006.

The importance of biometric technologies has dramatically increased because of the events of September 11, 2001. Homeland defense is now the highest of priorities for many countries. These countries are now seriously considering or have already approved new legislation that calls for the investigation and use of biometric technologies as soon as possible for homeland defense applications. Accounting for systems developers, resellers and the influence that biometrics is expected to have in other industries and the IT industry as a whole the forecasts above are expected to be a substantial catalyst for the global IT market.

This expected growth, however, is placing a greater demand on the international biometric industry, biometric system developers, researchers and end-users to work together to address in cooperation a number of issues including privacy, testing and evaluation, infrastructure, cost, scalability and open system interoperability and data interchange.

An earlier impediment to adoption was the lack of industry standards. The development and adoption of biometric standards has been progressing over a number of years, first through standards that the law enforcement community could use [4] and then in the commercial world. Since 1999 the biometric industry and end-users developed through international industry consortia interoperability and data interchange standards that can now perhaps be formalized through JTC 1 SC 37. They include the BioAPI specification and CBEFF- the Common Biometric Exchange Framework Format.

### *Biometric Application Programming Interface (BioAPI)*

The BioAPI specification was developed by the BioAPI Consortium [5] which consists of over 90 organizations representing biometric vendors, Original Equipment Manufacturers (OEMs), major Information Technology (IT) corporations, systems integrators, application developers, and end-users. The BioAPI V1.1 specification promotes interoperability by defining a generic way of interfacing to a broad range of biometric technologies. The BioAPI Specification defines an open system standard API that allows software applications to communicate with a broad range of biometric technologies in a common way. As an “open systems” specification, the BioAPI is intended for use across a broad spectrum of computing environments to insure cross-platform support. BioAPI specifies standard functions and a

biometric data format which is an instantiation of CBEFF. It specifies basic functions (e.g., enroll user, verify asserted identity, discover user's identity) and primitive functions (e.g., create template, process, verify match, import). BioAPI supports a wide range of biometric technologies and it is designed for use in a broad range of applications, extending from embedded devices (such as in cell phones) to large-scale identification systems (such as national ID systems), as well as user authentication applications associated with computer and network access. The specification and associated reference implementation are open source and can be downloaded from the BioAPI Consortium web site. In September 2001, the BioAPI Consortium submitted their BioAPI Specification, Version 1.1 to the InterNational Committee for Information Technology Standards (INCITS) [6] for fast track processing within the US. Subsequently, ANSI/INCITS 358-2002 - Information technology - BioAPI Specification, was approved on February 13, 2002. The growing market deployment of standards based biometric technologies will inevitably lead to the need for this standard to evolve. It is anticipated that this evolution will require very active maintenance by the new JTC 1 SC.

#### *Common Biometric Exchange File Format (CBEFF).*

CBEFF [7] describes a set of data elements necessary to support biometric technologies in a common way independently of the application and the domain of use (e.g., mobile devices, smart cards, protection of digital data, biometric data storage). CBEFF facilitates biometric data interchange between different system components or between systems, promotes interoperability of biometric-based application programs and systems, provides forward compatibility for technology improvements, and simplifies the software and hardware integration process. The data described by CBEFF includes: (1) the location of the biometric data within the CBEFF structure; (2) security options (digital signatures and data encryption); and (3) processing information such as identification of the biometric type (e.g., facial features), record data type (e.g., processed biometric data), the format owner (e.g., ID of an entity such as a vendor or organization) that defines one CBEFF biometric data format and the format type (biometric data format specified by the format owner). The International Biometric Industry Association (IBIA) [8] is the Registration Authority for CBEFF format owner and format type values for organizations and vendors that require them. CBEFF was developed in coordination with industry consortiums (BioAPI Consortium and TeleTrust) and a standards development group (ANSI/ASC X9F4 Working Group). During 2002 NIST/BC Biometric Interoperability, Performance and Assurance WG [9], an international organization of over 100 members from fifteen countries representing government agencies, industry and academia, developed an augmented version of CBEFF (downward compatible with the original version of CBEFF) in cooperation with biometric experts, and members of standards organizations developing related standards (i.e., ISO/IEC SC 17 WG4). The augmented version of CBEFF specifies: (a) a Product Identifier (in addition to a Format Owner to uniquely identify the originator of a CBEFF biometric data structure); (b) validity period for the biometric data; (c) location of challenge data and data payloads; (d) a nested structure to accommodate different biometric data types and modes in the same CBEFF structure; and (e) the use of biometric data in a smart card data structure compatible with CBEFF. A new name was proposed: *Common Biometric Exchange Framework Format (CBEFF)*. The augmented version of CBEFF is a candidate for Fast Track as an ANSI

standard through the InterNational Committee for IT Standards (INCITS) and INCITS Technical Committee M1 – Biometrics [10] and it is expected that a contribution about CBEFF will be submitted to JTC 1 SC 37 for consideration of the augmented version of CBEFF as a JTC 1 fast track candidate.

### **1.3 PROJECT REPORT**

The initial Plenary Meeting of JTC 1 SC 37 will be held 11 December – 13 December, 2002. Section 1.6 below provides details on the first JTC 1 SC 37 Plenary Meeting including project proposals. Section 2 (below) will briefly describe JTC 1 SC 37 member's contributions as of September 20, 2002.

### **1.4 STRATEGIES AND COOPERATION WITH OTHER ORGANIZATIONS**

The experts from the biometric industry, system developers and end-users that are expected to participate in JTC 1 SC 37 are motivated to rapidly develop international standards that support the mass market adoption of biometric technologies. This will require effective cooperation between the newly established JTC 1 SC 37 and some other JTC 1 SCs that are developing related IT international standards such as standards that specify means of storing, transporting, securing and managing authentication data. The perception of biometric industry experts and end-users is that if the JTC 1 SC 37 program of work is expected to succeed, international standards that relate to fields that will influence, for example, total system interoperability will need to be developed at the same pace that JTC 1 SC 37 intends to develop biometric standards.

These same experts feel that JTC 1 SC 37's goals must include developing critical biometric standards such as common file formats, application programming interfaces (APIs), biometric data formats (e.g., templates, image formats), Application Profiles and methodologies for performance evaluation and conformity assessment which fits well with the initial JTC 1 SC 37 scope. The international biometric industry, systems developers and end-users have developed and approved consortia standards such as the BioAPI specification and the Common Biometric Exchange File Format through consensus-building open processes over for the last few years. The JTC 1 SC 37 community will have to consider how to most quickly process these consortia standards to formal international voluntary consensus standards through JTC 1 SC 37.

JTC 1 SC 37 will need to focus on the development of a slate of international standards that both the industry and the end-users need and that other JTC 1 SCs and even other ISO/IEC TCs could utilize by reference within their own standard projects. This approach will make efficient use of the of the biometric experts, in the most cost-effective way and avoid duplication of efforts (or even conflicting biometric standards).

In order to achieve this synchronization of efforts, JTC 1 SC 37 needs to immediately establish strong liaisons with other JTC 1 SCs (i.e., SC17 and SC27), ISO TCs (e.g., ISO TC68), other organizations with responsibility of developing consortia standards (e.g., BioAPI Consortium and NIST/BC Biometric Interoperability, Performance and Assurance

WG) and other international organizations that reflect the needs of many end-users (e.g., ICAO). JTC 1 SC 37 will incorporate other international standards by reference whenever possible.

## **1.5 MEMBERSHIP**

The following list reflects JTC 1 SC 37's membership as of September 20, 2002.

### **P-Members:**

CANADA
DENMARK
FINLAND
FRANCE
GERMANY
ITALY
JAPAN
KOREA, REPUBLIC OF
NETHERLANDS
NORWAY
SWEDEN
SWITZERLAND
UNITED KINGDOM
USA

### **O-Members**

AUSTRALIA
IRELAND
SINGAPORE

### **Internal Liaisons within ISO/IEC JTC 1**

To be determined

### **Internal liaisons with ISO/TCs**

To be determined

## **Category A Liaison Requests**

### **INTERNATIONAL TELECOMMUNICATION UNION (ITU)**

## **External Category C Liaisons**

To be determined

### **1.6 JTC 1 SC 37 CALENDAR OF MEETINGS 2002**

The first JTC 1 SC 37 Plenary meeting will be held 11 December – 13 December 2002 at the Wyndham Palace Resort & Spa, Orlando, Florida, USA hosted by the US. JTC 1 SC 37 N13 provides information on the Plenary Meeting. It includes the meeting package and the registration form.

## **2. INITIAL FOCUS OF JTC 1 SC 37 WORK**

As described in Section 1.1, the initial JTC 1 SC 37 focus will be the development of generic biometric standards including common file formats; application programming interfaces; biometric templates; template protection techniques; and related application/implementation profiles, as well as methodologies for conformity assessment.

As of September 20, 2002 the following JTC 1 SC 37 member contributions have been received:

ISO/IEC JTC 1/SC37 N5: US Contribution to SC 37 on a New Work Item Proposal for an Application Profile- Interoperability and Data Interchange-Biometric Based Verification and Identification of Transportation Workers

ISO/IEC JTC 1/SC37 N6: US Contribution to SC 37 on a New Work Item Proposal for an Application Profile-Interoperability and Data Interchange-Biometrics-Based Verification and Identification for Border Crossing Applications

ISO/IEC JTC 1/SC37 N7: US Contribution to SC 37 for a New Work Item Proposal for an Application Profile-Interoperability and Data Interchange Point-of-Sale Biometric Identification

ISO/IEC JTC 1/SC37 N8: US Contribution to SC 37 on a New Work Item Proposal for an Application Profile-Finger Minutiae Format for Data Interchange

ISO/IEC JTC 1/SC37 N9: US Contribution to SC 37 on a New Work Item Proposal for an Application Profile-Finger Pattern Based Interchange Format

ISO/IEC JTC 1/SC37 N10: US Contribution to SC 37 on a New Work Item Proposal for an Application Profile-Face Recognition Format for Data Interchange

ISO/IEC JTC 1/SC37 N11: US Contribution to SC 37 on a New Work Item Proposal for an Application Profile-Iris Recognition Format for Data Interchange

ISO/IEC JTC 1/SC37 N12: US Contribution to SC 37 on a New Work Item Proposal for an Application Profile-Finger Image Based Interchange Format

More technical contributions in the above areas are anticipated by the November 2nd due date.

Technical contributions to the First Plenary Meeting of SC37 may also include a Biometric API for Java Cards (TM) and a Biometric Template Protection and Usage specification as technical contributions for consideration of further processing. Also it is expected that JTC 1 SC 37 will address contributions on a harmonized vocabulary, and the need to address biometric “system” performance measurements and standardized test procedures.

JTC 1 SC 37 will also be expected to address suitability of the JTC 1 fast track process and US interest in submitting the following industry consortia standards to JTC 1 for fast track processing and placement in JTC 1 SC 37:

1. ANSI/INCITS 358, BioAPI V1.1 Specification.
2. Contribution of the Augmented Version of CBEFF (Common Biometric Framework Format) NISTIR-6529-A Upon Approval of the NIST/BC Biometric WG.

## **MARKETING INITIATIVES AND STRATEGIES**

JTC 1 SC 37 will provide profuse information on the progress of standardization work and opportunities for new work under JTC 1 SC 37 through the JTC 1 SC 37 web site, press releases as needed, articles in technical publications, through presentations in standard development bodies within and outside of the JTC 1 organization and through international conferences and forums (e.g., Biometric Consortium) that address biometric technologies and related fields and other IT-related fields.

## **REFERENCES**

[1] Biometric Consortium Web Site: <http://www.biometrics.org>

[2] Advocacy Report, Volume IV, Number 1, Friday, January 18, 2002, International Biometric Industry Association Biometrics (<http://www.ibia.org>).

[3] Biometric Market Report 2003, International Biometric Group, <http://www.ibgweb.com>

[4] ANSI/NIST-ITL 1-2000 standard, "Data Format for the Interchange of Fingerprint, Facial, & Scar Mark & Tattoo (SMT) Information

[5] BioAPI Consortium Web Page: <http://www.bioapi.org>

[6] InterNational Standards Committee for Information Technology Standards (INCITS)  
Web Page: <http://www.incits.org>

[7] NISTIR 6529, "Common Biometric Exchange File Format (CBEFF)", January 3, 2001. A copy of NISTIR 6529 can be downloaded from the CBEFF web site:  
<http://www.nist.gov/cbeff>

[8] International Biometric Industry association Web Site: <http://www.ibia.org>  
CBEFF Format Registry: <http://www.ibia.org/formats.htm>

[9] NIST/BC Biometric Interoperability, Performance and Assurance WG Web Site:  
<http://www.nist.gov/bcwg>

[10] INCITS M1 –Biometrics Web Page: [http://www.ncits.org/tc\\_home/m1.htm](http://www.ncits.org/tc_home/m1.htm)

**Fernando L. Podio**  
**Summary of Related Experience**

Fernando Podio is a member of the Convergent Information Systems Division of the Information Technology Laboratory, National Institute of Standards and Technology (NIST). He has been involved in information technology development, measurements, and standards efforts for many years. For the last four and a half years he has been involved in biometrics research and standardization. Mr. Podio co-chairs the Biometric Consortium (BC). The BC has over nine hundred members from thirty-eight different countries from Government, industry and academia. He also co-chairs NIST/BC Biometric Interoperability, Performance, and Assurance Working Group. An international organization of over 100 members. In addition, he serves on the BioAPI Consortium Steering Committee and chairs BioAPI's Consortium External Liaisons Working Group.

Mr. Podio is currently co-chairing the Common Biometric Exchange File Format (CBEFF) Technical Development Team. Under the CBEFF development he led an effort to achieve consensus on the biometric data structure defined in CBEFF among a diverse group of industry consortiums (e.g., BioAPI Consortium, the International Biometric Industry Association and the Interfaces Group of TeleTrusT-Germany) and standards technical development groups (e.g., ANSI X9F4 – Banking, Financial and ISO/IEC JTC 1 SC17 WG4).

Mr. Podio's extensive experience in the development of voluntary industry standards extends also to other IT areas such intelligent data storage devices, interoperability of sequential storage media and optical disks. He was awarded NIST's William P. Slichter Award for "Outstanding Achievement in building or strengthening ties between NIST and industry" and the Association for Information and Image Management International (AIIM)'s Laureate of Information Technologies in Electronic Document Image Management.